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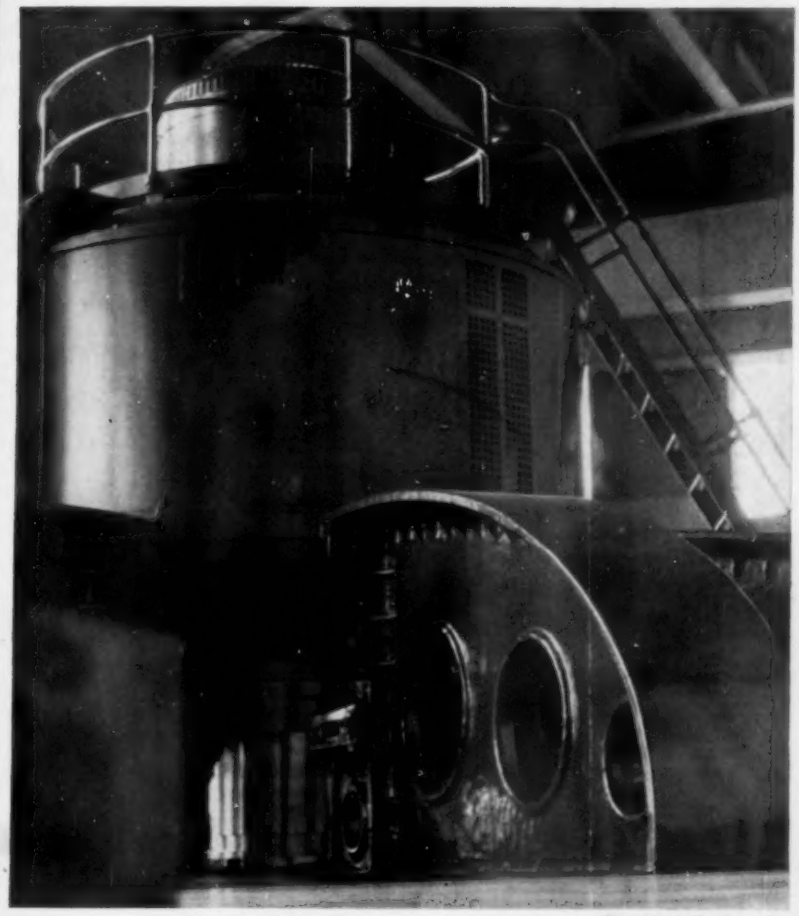
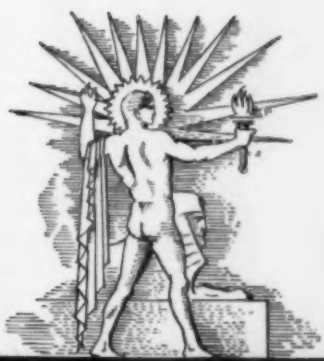
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



Electrical Engineering



AUGUST 29, 1931

Huge, Powerful and Beautiful

See Page 137

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XX *No. 542*

The Weekly Summary of Current Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Science, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—$5.00 a year postpaid. 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

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Advertising rates furnished on application.

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Publication Office, 1930 Clifton Ave., Baltimore, Md. Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

DO YOU KNOW THAT

Conditions for radio reception are good in Alaska.

A three-color moving picture film that has been produced in England is said to be adaptable for use in regular moving picture cameras.

In the past 40 years, more than 1700 new cities of over 2,500 population have come into existence in the United States.

Because iron meteorites fell from the sky, some Egyptian astronomers thought that the sky might be a plate of iron.

The Indians of pre-Columbian America had no beasts of burden except the llama which carried light loads and the dog which could be used to drag sledge-like conveyances.

An Australian anthropologist says that the world is so nearly explored that there are only a few small areas of the earth where natives have never seen a white man.

Boys are more likely to be left-handed than girls are.

Rainfall in the United States has been below normal every month except three during the past 17 months.

Mayan Indians of Yucatan invented a symbol for zero, centuries before the Hindus introduced this useful mathematical device in the Old World.

There are 10,000 head this year in a single herd of caribou in Mount McKinley National Park, Alaska, and there are other herds in the vicinity.

Centuries before modern knowledge of food values in citrus fruits, a Chinese writer declared that the peel of the orange was a good tonic.

Because of the fact that tiny fish cannot protect themselves against their natural enemies, fish culturists have found that planting 100,000 six-inch trout, raised in rearing ponds, gives results equal to planting 1,000,000 small fry directly in streams.

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Science Service presents over the radio, an address

THE CLASH OF GEOLOGIC FORCES

By Dr. W. H. Twenhofel, Chairman, Division of Geology and Geography, National Research Council

Friday, September 4, at 2:45 P. M, Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ENGINEERING

Breaking Point of Ships Is Learned Through Actual Tests

Old Destroyers, on Way to Scrap Heap, Made to Yield Information Valuable to Proper Design of Future Vessels

USUALLY a naval vessel to be junked is simply torn up into scrap iron—and that's the end of her.

But not so with the U. S. S. Preston and Bruce, two wartime destroyers that have reached the end of their useful life and are eventually to go into the scrap heap at the Norfolk Navy Yard. Before being completely destroyed these vessels were made to yield information about the strength of their steel beams and plates that should be of great value to designers of ships of the future.

"These tests are significant," it is explained by Lieutenant-Commander C. O. Kell of the Navy Department's Bureau of Construction and Repair, "in that it is the first time that the ultimate strength of full-sized ships has been scientifically determined. A great amount of data was obtained which will make possible the design of better ships and the design of ships' hulls of given strength of minimum weight.

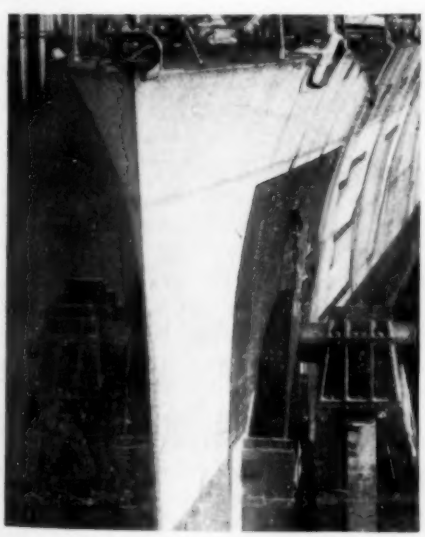
"It is not intended that the information and data obtained be considered as at all military, and therefore confidential, but rather that it be made available for study by all with the hope that it may be of the greatest possible constructive benefit to the science of naval architecture."

With Commander Kell in charge both vessels were first drydocked. The Preston was then firmly supported on two cylindrical steel beams driven through the ship near each end and the wood blocks beneath the vessel were pulled out. Then her hold was heavily loaded with water ballast and huge steel chains. Two hundred and twenty tons of this weight were added to the ship, the previous displacement of which was 992 tons.

While the water was high in the drydock the destroyer almost floated and did not feel the additional 220 tons weight. But when the water was gradually pumped out the additional weight bore down heavily amidships and strained the ship's structure as though she were on the crests of two huge waves with a trough beneath her center. The water was pumped down six times; each time to a new low level, which increased the strain on the vessel until she finally cracked in the middle and dropped two feet nearer the bottom of the drydock.

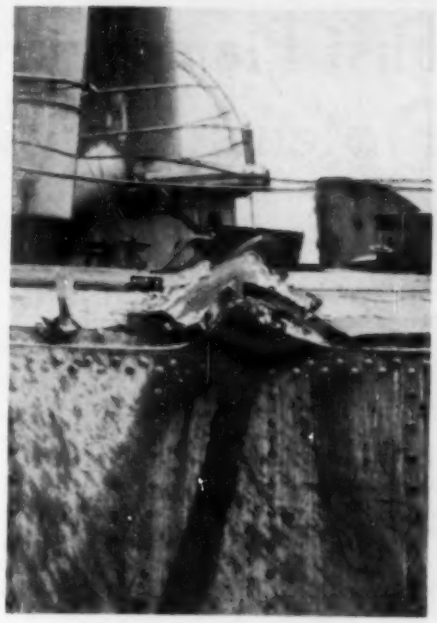
Every time the water was lowered, strains in the steel of the boat were accurately measured at 275 different points and continuous records of the minute elongations and compressions of important beams were made automatically on rolls of paper. The testing was observed by Dr. L. B. Tuckerman, of the U. S. Bureau of Standards, an expert on the strength of materials.

While the Preston received a "sagging" test, the Bruce was given a "hogging" test. The Bruce was supported amidships on two beams only 25 feet apart so that her bow and stern rose clear of the bottom of the drydock. The fury of a storm would deal with a vessel in this fashion by balancing her precariously on top of a wave, leaving the bow and stern almost out of the water. Six hundred and eighteen tons of iron weights were divided between the bow and stern. The water in the drydock was then gradually lowered and tests made until the vessel could no longer hold the weight and cracked amidships.



PIERCED THROUGH

That is what was done to the ends of the U.S.S. Preston when the steel beam was inserted to hold her up as the water was pumped from around her.



WHAT HAPPENED

When the weights were applied to the middle of the destroyer Preston this break occurred on the deck and side.

These tests should enable naval architests to design fighting vessel hulls at a saving in weight over present specifications, and yet make them sufficiently strong. The necessity for this is explained by Captain H. S. Howard, of the Bureau of Construction and Repair, who says:

Reduce Weight in Hull

"It is possible to make ships so heavy and strong that failure would be practically out of the question. However, if excess weight for strength be worked into the hull of a ship, the amount of weight available for other qualities will be correspondingly reduced, and the military features of the ship will suffer.

"Since the coming into effect of the Washington and London treaties, it has become more important than ever to use no more weight in the hull of a ship than is absolutely necessary to insure adequate strength. By these treaties all modern naval vessels were designed within certain fixed displacements. It has become imperative, therefore, that the hull and machinery weights be kept to a minimum so that maximum weight may be used for the armament, speed and protection."

BOTANY

First Plant Patent Granted Protects Everblooming Rose

THE FIRST plant patent has been granted.

The protection of the new U. S. patent law was extended a plant breeder for the first time when Henry F. Bosenberg of New Brunswick, N. J., was issued U. S. Plant Patent No. 1 covering "a climbing or trailing rose," the patentable feature of which is its everblooming character.

The everblooming rose, called the New Dawn, was found as a freak of nature among a group of Van Fleet roses purchased by Mr. Bosenberg for use in landscape work.

"The plant was observed closely for two seasons before any attempt was made to propagate it," Mr. Bosenberg says, "and when plants propagated from it by budding or grafting bloomed the very first year and continued to bloom, and plants which in turn were budded from these young plants also continued to bloom, it was felt that the sport was fixed and that there would be little or no danger of its reverting to the original Van Fleet. The rose has been propagated for the past four years and among the thousands of plants observed we have not seen any tendency to revert back to the old type of rose which bloomed only once a year."

Mr. Bosenberg is of a family of plant growers. His father, who recently became an American citizen at the age of 72, was at one time a prominent cyclamen grower of Germany.

The plant patent law has been the subject of much difference of opinion among the scientists of the U. S. Department of Agriculture, which has to act as expert judge of plant patent applications. Some hold that the law will never be workable and that it is useless to try it. Others believe that it may be workable and should be tried, because if it does turn out to be satisfactory it will bring reward to a deserving group of men and will stimulate the development of new plants.

This first patent may test the practicability of the law. It is understood that about 50 applications are now pending.

Science News Letter, August 29, 1931

PROTECTED

Henry F. Bosenberg, to whom the first plant patent was granted, and his rose, the New Dawn.

BOTANY

Pink-Fleshed Lemon Developed in California

PINK LEMONADE, colorful memory of childhood circus days, may be the next thing of that gay period to stage a comeback. And this time it will have authentic pink lemon slices to float in it, a trimming which it lacked in the old days. At the Riverside experiment station of the U. S. Bureau of Plant Industry a lemon has developed a "bud sport" which produces fruit with bright pink flesh.

Science News Letter, August 29, 1931

California has 28,000 acres of commercial olive orchards.

PHYSICS

Sky's Blue Believed Caused By Electron Streams From Sun

ELECTRONS streaming from the sun may be the cause of our familiar but mysterious blue sky, Dr. Willi M. Cohn of the University of Berlin has concluded as the result of his experiments in which a blue light very similar to that from the sky was produced in the laboratory. Dr. Cohn is doing high temperature research at the A. D. Little laboratories.

Dr. Cohn experimented in Berlin with cathode rays in a high vacuum, formed in a tube similar to the X-ray tube. He allowed the stream of electrons, which is the cathode ray, to meet larger electrically charged particles of matter, known as ions, which are formed either from a piece of radioactive metal, such as thorium, or from a gas. The blue light appeared where the electrons and the ions came together.

This blue light can be broken up by prisms to form a spectrum or "rainbow" of continuous color, just as is found in sunlight. The blue light from the clear sky also shows a continuous spectrum, although gases, such as the air this light passes through, have quite different spectra, which show only thin colored lines. Dr. Cohn points out that at the upper layers of our atmosphere electrons continually arriving from the sun and ions of the gases which form our air meet in the intense vacuum of space. Since under such conditions in his laboratory the blue light which is so like the light from the blue sky is formed, he believes that the blue of the heavens may, at least partially, have the same cause as that of the laboratory.

Since the time of Newton scientists have speculated on why the sky is blue. The most successful explanation heretofore has been that of Sir John Tyndall and Lord Rayleigh which considers it due to sunlight broken up in a particular way by spherical particles in the atmosphere. Dr. Cohn states that his theory does not conflict so far as direct sunlight is concerned. He points out that the Tyndall-Rayleigh theory would expect the light from the sky to be polarized so that all its waves would vibrate in a particular way. The light produced by Dr. Cohn in the laboratory is not polarized, and daylight is only partly polarized, partly not.

Science News Letter, August 29, 1931

MEDICINE

Synthetic Antiseptic Found Effective Against Hookworm

Potent Drug is Harmless to Man and Can be Used as Well In Fighting the Round-Worm Which Causes Ascariasis

A SAFE and apparently certain treatment for hookworm has been found in the synthetic antiseptic hexylresorcinol.

This important discovery in the field of medicine was announced by Dr. Veader Leonard of the School of Hygiene and Public Health of the Johns Hopkins University before the Section on Tropical Medicine of the Third Pan-American Medical Congress in Mexico City recently.

Dr. Leonard himself first described the bactericidal properties of the drug, but not the fact that it is effective against hookworm and ascaris. Since 1924 it has been known that the synthetic chemical, hexylresorcinol, is seventy times stronger than carbolic acid, and at the same time practically non-toxic to man. It has been used as a general as well as internal antiseptic during the past few years.

Discovered its Potency

Dr. Paul D. Lamson, professor of pharmacology at the Vanderbilt University School of Medicine, discovered its potency in hookworm disease and ascariasis, while investigating the problem of safe remedies. The work was sponsored by the International Health Division, Rockefeller Foundation.

Hookworm, the "disease of backwardness," is one of man's oldest diseases, for its symptoms are apparently described in ancient Egyptian papyri. In present times it is claimed that one-half of the world's population lives in areas where it is prevalent. Millions of people are infected by it, and the havoc it does is incalculable.

The problem in America, Dr. Leonard says, is largely a matter of the control of the two parasites, hookworm, and ascarids or common round-worms. Carbon tetrachloride and oil of chenopodium are specific against only one of these parasites, while many patients have both. Treatment with carbon tetrachloride is sometimes dangerous. While it may kill the hookworms, it irritates the ascarids and causes them to begin a migration to escape the drug, with serious effects upon the patient.

The new drug, hexylresorcinol, is effective against both parasites, and against even a third, *Trichuris trichiura.* The chemical is easy to take, has no bad after-effects, and seems to be one hundred per cent. efficient when directions are followed. It is effective in this instance only in its crystalline form, made into sugar-coated pills. Four-tenths of a gram is enough for children under six, while one gram is enough for persons twelve or over. It must be taken on an empty stomach and no food should be eaten for four hours afterwards.

Dr. Leonard does not yet know whether this drug will be as effective against European hookworm as against the American, or less so as is true of carbon tetrachloride. It is not known whether it will be useful against other nematodes and cestodes parasitic to man. Present results are based on experiments made with about 1,500 persons in the United States. Other investigations now on foot in Japan, China, the Philippine Islands, India, Siam, Egypt, the southern part of the United States, and Mexico may answer these questions.

Science News Letter, August 29, 1931

ASTRONOMY

Good Reports Received From Meteor Observers

METEOR watchers have had good success during their recent vigils for the Perseid shower of "shooting stars," Dr. Charles P. Olivier, director of Flower Observatory, Upper Darby, Pa., has informed Science Service. In response to his recently broadcasted request that amateur observers throughout the United States and Canada keep systematic records of the numbers, times and directions of fall of all meteors observed, he has already received reports from 47 groups and individuals, scattered through 22 states and provinces. Watchers in the neighborhod of his own observatory and elsewhere in the East were disappointed, because of cloudy weather during the climax period for the shower.

"While many more reports are doubtless en route, enough are in to prove that the maximum of the Perseids was quite a good one," Dr. Olivier states. "For observers with good eyesight and clear skies, the rate after midnight rose to two per minute, which is well over the average reported in most years. Of course those handicapped by poorer conditions saw fewer. Many brilliant meteors accompanied the shower and numerous observers are enthusiastic over what they saw.

Science News Letter, August 29, 1931

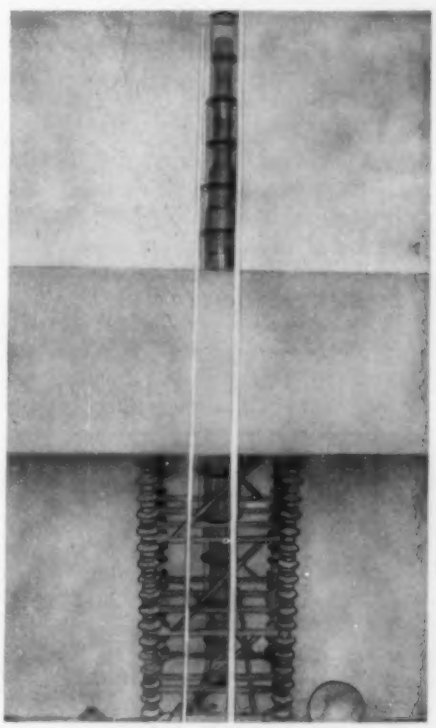
PHYSICS

X-ray Tube of More Than Million Volts Installed

NOT SATISFIED with two 600,000-volt X-ray tubes, California Institute of Technology physicists have installed a giant 1,200,000 X-ray tube in the new Kellogg radiation laboratory.

Under the direction of Dr. C. C. Lauritsen, nationally known X-ray expert, the tube was assembled. It occupies the center of a specially designed room. The tube is exactly 30 feet high.

Science News Letter, August 29, 1931



A TOWER OF HEALING

The thirty-foot X-ray tube which will be used for research into new methods of treating cancer and other ills.

GENETICS

False Fiction Families

Authors are Accused of Disregarding the Laws of Heredity In Creating Characters Who Actually Would not Exist

By Marjorie Van de Water

"If the horse kicks and the mare kicks, the colt is sure to kick," so goes the old adage. Scientists formulate the laws of heredity in very different language, involving such terms as "Chromosome," "Gene," "Dominant," and "Recessive." The import of the scientific law is, however, much the same as that of the old saying.

If both parents are feeble-minded, the chances are that the children will be mentally defective. If both parents are brown-eyed, we should not expect a family of blue-eyed children. Though we may expect some brown-eyed parents to have a minority of blue-eyed children.

So it is in life. But fiction writers are accused by a prominent geneticist, Dr. Wilhelmine E. Key, of tossing all these rules of science and common sense to the four winds.

Hinges on Heredity

"In novels," says Dr. Key, "any kind of father and mother can have any kind of son or daughter."

Often the very point of the story hinges on the heredity of the hero or heroine—a heredity which the scientist tells us could not possibly have resulted in such a child in real life.

And it is not alone the young and inexperienced writer whom Dr. Key calls to account for thus ignoring the scientific laws of heredity. Some of the most prominent writers of today are among those she accuses. The following names she chose at random from the list of authors who have created impossible fiction families: Alice Brown, who is well known for her "Children of Earth," "Margaret Warrener," and other best sellers; Joseph Hergesheimer, who has given us "Balisand," "Java Head," "Tol'able David," and a great many other novels and short stories equally popular; John Galsworthy, the scholarly writer of the famous "Forsyte Saga," "Escape," "Dark Flower," "Old English," and other plays and novels as well known to the movie-goer as to the browser in libraries; A. S. M. Hutchinson, so well known for his "If Winter Comes," and May Sinclair.

These authors do not disregard or ignore other scientific facts, Dr. Key hastens to assure us. Indeed, she picked her list from the writers who, she reminds us, are justly celebrated for wide and keen observation and penetrating analysis.

"Nowhere," she says, "have the advances of science had a more telling influence than on the fiction of the day. These advances have broadened tremendously their range of subject matter and proportionately their power of presentation of its truths. A myriad of new and fascinating aspects of nature have thus been opened to our gaze, as well as many far-reaching problems of human conduct, all of which have become grist for the best-sellers' mill.

"So radio-activity, Freudianism, mental sub- and abnormality and the endocrine personality find their way to more or less effective embodiment in the fiction of the day. Indeed, so eager is the fictionist in his quest for the latest and most sensational developments in certain fields that he frequently keeps in advance of the well-established and the true."

But in other fields, and particularly in this field of heredity, the modern writer of fiction "lags lamentably behind and subscribes to wornout beliefs which would shame the most carelessly unintelligent."

One of these beliefs which scientific discovery has caused all but the superstitious to discard is the fallacy that the thoughts or yearnings of the mother before the child is born can change the physical appearance of the child.

Students of heredity know that the child may "take after" his mother or his father, or rather that he may combine the characteristics of a number of his forebears on both sides, but the mother cannot by taking thought add one cubit to his stature.

Yet Sophie Kerr in her "Painted Meadows," makes the whole outcome of the story turn on such an impossible situation. In the novel, the heroine's son bears a striking resemblance to her former lover. This has been brought about by her continual dwelling on the image of this lover and the wish that the coming child were his child.

"Did such a thing ever happen in real life?" Dr. Key exclaimed. "If it were possible for it to happen, we venture to say that many a group of brothers and sisters would present a worse hodge-podge than it does now!"

Skipping Generations

Another fallacy with regard to heredity which has been dramatized in recent fiction, is the mistaken idea that a particular characteristic may skip generation after generation only to appear out of the long-forgotten past to plague the children of today.

You may inherit musical talent from a musical father, but scientists have found no evidence that all the piratical tendencies of the black sheep who was hanged in the reign of Queen Elizabeth are likely to suddenly crop out in the daughter of a family which has been by nature respectable and virtuous for all the generations in between.

Human traits which we receive through inheritance from our parents, whether they are physical such as eye or hair color, or mental or moral, are classed by biologists as either "dominant" or "recessive." The dominant trait is so called because it is able to dominate or hide other "recessive" characteristics. The recessive character shows only in the absence of the dominant.

Heredity is dual in nature, coming half from each parent. If a man inherits brown eyes from both father and mother, well and good; he has brown eyes. But suppose one parent hands down brown eyes and the other blue eyes. He is not likely to have one eye blue and the other brown, but the brown will hide the blue inheritance and he will show brown eyes to the world. To show a recessive character like pure blue eyes he must inherit it from both parents. The hidden inheritance is not, however, destroyed but is passed on just as the other one is passed on.

Thus there are two classifications of brown-eyed people—those who are pure for brown, and those whose eyes are brown but who carry also the recessive blue character. When two such blue-carrying brown-eyed people marry, then

part of their children—one-fourth on the average—will be blue-eyed, as they will inherit the blue character from both parents.

The dominant traits appear in each generation; recessive traits may skip a generation but will appear in the grandchildren if the children marry into a family having an inheritance of the same recessive trait. In the case of blue eyes, there are so many blue-eyed people in the world that this is almost sure to happen to some in a normal size family.

Thus recessive traits, unless they are some rare defect, will usually crop out in the second generation. Dominant traits will appear generation after generation.

On this ground, Dr. Key calls the heredity described in Alice Brown's "Black Drop" an impossible one. In the story, Charles Tracy "took back" to a seventeenth century ancestor from whom he received the "black drop." This ancestor was sallow and lean, with a heavy brow, small eyes and an obstinate chin. Of his portrait it is said that it would do for a "witch-burning, man-hanging judge."

Charles, like his remote forebear, is a dark and violent man, appearing in the bosom of an eminently respectable family. Of this situation, Dr. Key says:

"The author has realized to the full the dramatic possibilities of this juxtaposition of an alien offshoot to the eminently respectable members of the family tree. However, to secure this juxtaposition she resorts to a means so false as seriously to detract from the value of her book as a convincing work of art.

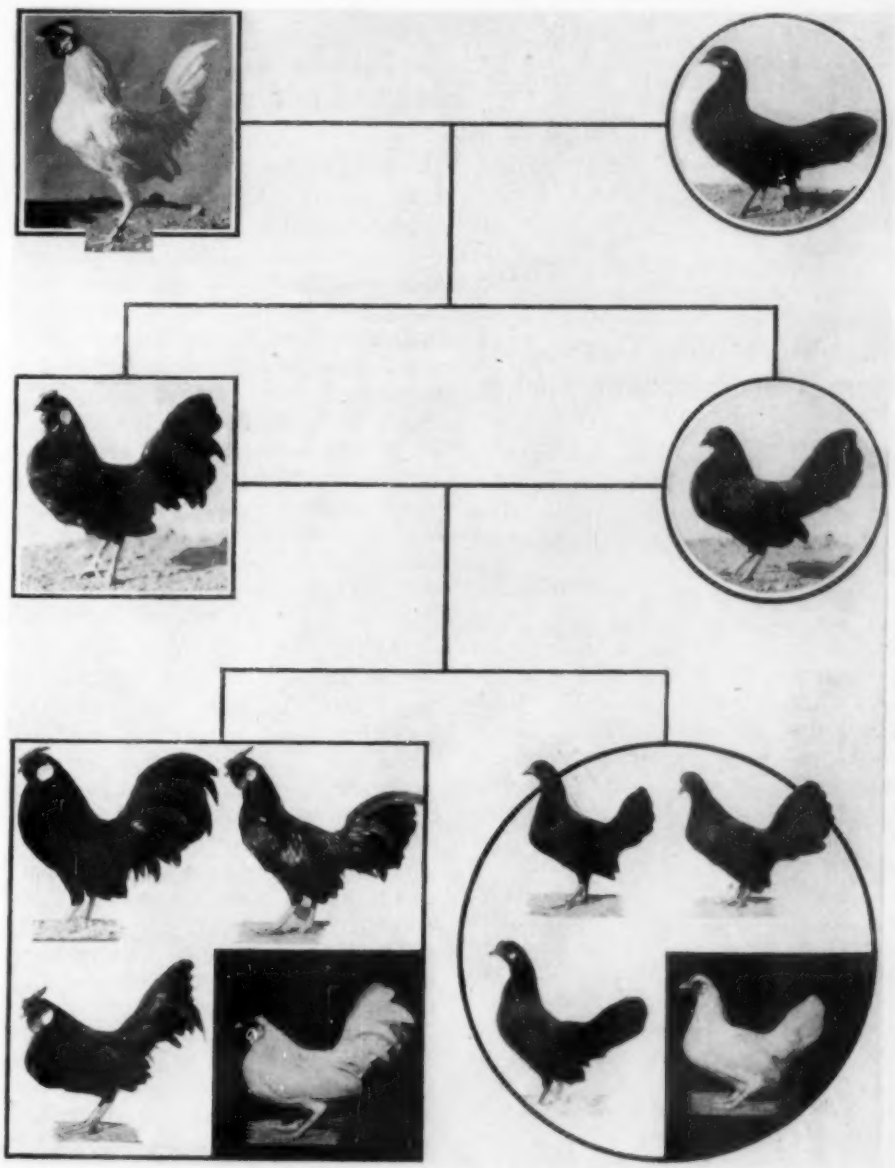
Just Doesn't Happen

"We are led to infer that this 'black drop' meandered along the stream of hereditary potentialities for nearly three centuries without once making an appearance. That gives scope for ten generations and the high degree of probability that it would show in each one of these generations whatever the type of marriage that was made. For the main attributes for which the drop stands, the swarthy coloring of hair and skin, the unstable temper, the tendency to sex-obliquity, all belong to the traits which tend strongly to make their appearance in fairly definite proportions from generaton to generation. . . . In life, it just doesn't happen that way."

Hergesheimer's "The Three Black Pennys" is criticized by Dr. Key for the same inconsistency with the teachings of scientists. In this work it was not a drop but "a certain black stream of Welsh blood cropping out undiminished after generations." The undesirable hereditary tendencies skip two and three generations to appear again in a manner quite at variance with all known and accepted genetic laws.

"The most flagrant violation of current genetic conceptions is to be found in A. L. S. Hutchinson's 'This Freedom'," Dr. Key said. "This is the novel which so stirred the ire of the feminists a few years ago. Here the violation is the more deplorable because the author knows so well how to employ devices for giving his characters and situations the illusion of reality."

Rosalie's father was, to quote the story, "a fierce, futile, flying figure, scudding about on the face of his parish in the wilds of Suffolk." He "always jumped blindly and wildly into things, only to stagger down into a morass heavier and more devastating to ambition." The mother was a completely negative character who although she had a talent for painting miniatures, lacked even the persistence to keep this up. Dr. Key de- (*Turn to page* 140)



HOW HEREDITY WORKS

Is shown in the series of photographs prepared by Robert C. Cook of the American Genetic Association. When the white bantam rooster was mated with a black hen, black was the dominant trait, and the first generation shows black but carries a white inheritance. When such white-carrying blacks mate, one-fourth of the young will be pure black, one-fourth pure white and half will have the mixed inheritance of their parents.

AERONAUTICS

Akron, in Motion, Has Increase of Lifting Power

ABOUT NINETY TONS will be the useful lift of the new airship *Akron,* hovering in the air with her engines cut off.

But turn on her eight Maybach power plants, send the ship speeding along at better than 60 miles per hour, and 20 tons will be added to her useful lift. She will now be able to carry 110 tons of men, munitions and fuel, instead of 90.

This strange ability of an airship to carry more while moving than at a standstill is called aerodynamic lift, Dr. Karl Arnstein, veteran airship builder and designer of the *Akron,* explained. Aerodynamic lift aided German Zeppelins in soaring above the clouds and bombarding England during the World War, it was stated by Dr. Arnstein, who built 68 airships for Germany during the war.

Science News Letter, August 29, 1931

ENTOMOLOGY

Bugs from India Destroy Homes of Poisonous Snakes

COCHINEAL bugs are used to destroy cactus clumps that harbor dangerous snakes in southern India. The bugs were imported by C. T. Jacob, as an experiment.

Two months or more after the insect had been set to work, the cactus plant begins to show the effects, and puts on heroic efforts to bear fruit. But it collapses instead. After that, Mr. Jacob noted that the insects breed mostly males with wings. Female cochineal has no wings. The insect, too, shows very safe tastes. Grass and weeds that spring up immediately where the cactus dies are untouched by the insect pest.

Cactus and cochineal both are native to America, probably to Mexico, for there more species of the plant are found than in any other place. Before the Spanish conquest of the New World the Aztecs of Mexico raised cochineal on cactus for dyes. The natives still use it in places today. The Spaniards took it to the Canary Islands, and ran a very profitable business there, until the Germans discovered aniline dyes in modern times. Other countries had imported the cactus too, for the same reason, but in some cases with disastrous results.

In Europe cactus did no harm, but in Australia it has infested great grazing areas, and in South Africa too it is becoming a problem. The fact is conditions were too ideal for its propagation. The natural enemies of the genus did not exist in Australia and other places as they existed in America. In Mexico, land of the cactus, it has reached a nice biological balance with its natural enemies.

One of these enemies is the cochineal bug. The species *Dactylopius tomentosus* is the one that has now been imported into South India. The cactus that it fights there is the *Opuntia dillenii,* which forms the lair of dangerous snakes.

Science News Letter, August 29, 1931

PSYCHOLOGY

Parents Responsible For Bright Child's Failure

IN GIVING mental tests to children sent to the Bureau of Children's Guidance because of failure and difficult behavior in school, psychologists there made the interesting discovery that a large number of these backward children were "intellectually supernormal."

Dr. Jeanette Regensburg, a member of the staff of the Bureau, undertook a special study of these children in order to find out what would cause such very bright children to fail so conspicuously in the very type of work where they might be expected to shine. A report of her findings is soon to be published in the scientific journal *Archives of Psychology.*

The fault was found to lie often with the parents, and the chief hindrance to success was in a desire "to keep my baby a child as long as I can." A love for books and excessive reading did not lead to high grades in school for these bright children. In fact, the chances for school success were better with those who had been encouraged by the parents to give up books in favor of a more active chumming with "the gang."

The grades of bright children most often began to fall off at the time they entered junior or senior high school. This, Dr. Regensburg believed, was because the school work and outside study is conducted in a more grown-up way in high school; there is less supervision and check-up. Because the bright child is often advanced until he is in a grade with others who are much older, he is often not mature enough to assume responsibility as well as the rest of his class.

Science News Letter, August 29, 1931

IN SCIENCE

ZOOLOGY

Growing in Close Quarters May Change Sex of Oyster

AMONG oysters, the female of the species is larger than the male.

Not only that; she was a he before he turned into a she.

The tangled tale of sex and size in the bivalve world has been worked out by M. D. Burkenroad of the Louisiana State Department of Conservation and is reported in *Science.*

Mr. Burkenroad examined and measured a thousand oysters, taken at random. He found that almost all of them less than about one and a half inches long were males, and those that were longer were females.

However, further observations showed that it wasn't all a mere matter of size. Crowding also seems to influence oyster sex. Oysters above the minimum "female" size grown close together had a considerable proportion of males.

Science News Letter, August 29, 1931

METEOROLOGY

Weather Study Precedes Location of Air Terminal

WITH the *Akron* soon ready to give more definite test to the practicability of trans-Atlantic air travel, the vicinities of Richmond, Washington, and Baltimore are under consideration as the location of a possible terminal for such commerce. Philadelphia has also been included in the group as being the most northerly point in the suitable area.

The locality of these four cities was recommended by Ward T. Van Orman, of the Goodyear-Zeppelin Corporation, builders of the *Akron,* after a thorough investigation of weather conditions along the Atlantic seaboard. The United States Weather Bureau cooperated in obtaining for him the necessary climatological and meteorological data. At present, devices to measure wind speed and direction have been erected at these cities and the resulting records will determine largely which one is to have the new air harbor.

Science News Letter, August 29, 1931

NCE FIELDS

DEMOGRAPHY

Religion and Life Length Apparently Correlated

MEMBERS of certain denominations should be better risks for the life insurance companies than are those who go to other churches, it is indicated by a report received by the American Genetic Association from Dr. Roland M. Harper, well-known Southern botanist and demographer.

In an effort to find out whether longevity is inherited or dependent upon other factors, Dr. Harper has gone through the cemeteries of different religious denominations and made records of the ages and dates of death as given on the tombstones. Tallahassee, Florida, was one of the cities studied.

It was found that the average age of those buried in the cemetery of the most aristocratic church in the city was considerably higher than those in other cemeteries. Even when only adults are considered—for the families in the aristocratic church have fewer children—the average age attained is greater than in other denominations.

In Jacksonville, Florida, one denomination has a cemetery divided by a wire fence into two parts, one side apparently being for orthodox and the other for reformed persons. The average length of life was about ten years greater on one side of the fence than on the other.

Science News Letter, August 29, 1931

ANTHROPOLOGY

Negroes, Formerly Slaves, Living in Soviet Russia

NEGROES, brought as captives and sold as slaves into a region that once supplied the fairest of white captives for the harems of Oriental potentates, are the singular discovery that has been made by a European anthropologist, Prof. B. Adler, now working in the U. S. S. R.

Recently he visited the Caucasian district of Abchasia and found there small colonies of Negroes, living quietly by themselves and keeping their blood relatively unmixed, in spite of encouragement recently received from Soviet officials to intermarry with the surrounding white population.

By following all local sources of information Prof. Adler obtained something of their history. At the beginning of the nineteenth century Mingrelian, Circassian and Abchasian chieftains used to raid Abchasia and sell their captives as slaves in Turkey, Egypt, Algiers and elsewhere in the East; frequently they exchanged them for Negro slaves. In this manner, at various times several hundred negroes came to Abchasia and their descendants are living there today in various villages, in each of which some negro families are to be found.

Science News Letter, August 29, 1931

PSYCHOLOGY

Learning Stages Similar For Both Man and Monkey

IF YOU were placed in a maze of passages without instructions, and your exit depended upon your catching on to the combination—two turns to the right, two the left, two to the right and two to the left—could you make it? How many wrong turns would you make before you learned the system? How long would it take? Would nine-year-old Johnny get ahead of you on it? Could you show your superiority to monkeys?

At the psychological laboratories of Clark University adults and children were allowed to display their skill with this kind of unexpected problem in an experiment conducted under the direction of Dr. Walter S. Hunter by Louis W. Gellerman.

The maze was built of wall-board with inside partitions of the same material. The passages could be closed by doors operated by the unseen scientist on the outside. When the person tested took the correct turn he would find the door open, but it would close and lock after him. A wrong turning would bring one up against a locked door. No hint of what was coming was given the persons tested—they were merely asked whether they wouldn't like "to go in there and look around." Once in, they were locked in until they had solved the "combination."

Fortunately for man's pride, he did do better than the monkeys, though he went through similar stages of learning. At first he went through a "random" stage when he made many useless moves. Then he would begin to work out a system, finally taking the correct turns, hesitating only at points.

Science News Letter, August 29, 1931

ENGINEERING

Huge Generators Yield Beauty to Photographer

See Front Cover

THROBBING electric generators, the machines which are the heart of the great system supplying light and power to more than 120 millions, are odd and beautiful subjects for the talented photographer. In the picture on the cover, Rittase of Philadelphia, has caught the spirit of one of the largest hydro-electric generators.

It is one of the seven 54,000 horsepower units of the Conowingo plant on the Susquehanna river in Maryland. This plant supplies a large share of the industrial load of the Philadelphia district and is so designed that its 378,000 horse-power of installed capacity can be increased at the demand of the market.

As large as they are, these generators are not a part of the biggest hydro-electric units in the world. Niagara Falls has such machines of 90,000 horse-power capacity and the Dnieprostroy project now being completed on the Dnieper river in the U. S. S. R. will contain 100,000 horse-power units.

Science News Letter, August 29, 1931

ARCHAEOLOGY

Fishing Tackle Outfit of Prehistoric Indian Found

FISHING tackle belonging to some prehistoric Indian of the California coast has been discovered by Richard Van Valkenburgh, of the Los Angeles Museum, at an Indian village site near Redondo Beach.

Abalone and mussel shells were the favorite material for making fish-hooks in this region. Judging by the amount of fish bones found in the camp debris, the fishermen were highly successful with their shell hooks.

The fishing outfit which has been unearthed consists of a stone drill, shell blanks, and a partially completed hook.

To make a hook, the fisherman first broke a rough, oval piece of shell from a fresh abalone. This was ground down on a sandstone slab to a pear shape. Then a hole was drilled in the center of the blank shell and enlarged until only a rim was left. Then a cut was made in one side of the rim to create a rounded, incurving hook. The place where the line was to be attached was flattened at the top. To hold the line in place, it was cemented to the shell with tar.

Science News Letter, August 29, 1931

CHEMISTRY

Cerium Group of Rare Earths

"A Classic of Science"

The Puzzle of the Rare Earths Sharpened Chemists' Wits To Devise New Analytical Methods for Separating Them

ACCOUNT OF EXPERIMENTS MADE ON A MINERAL CALLED CERITE, AND ON THE PARTICULAR SUBSTANCE WHICH IT CONTAINS, AND WHICH HAS BEEN CONSIDERED AS A NEW METAL. By M. Vauquelin. In Philosophical Magazine, Vol. XXII, 1805.

Cerium

M. KLAPROTH wrote to me, about eight months ago, that he had discovered, in a mineral of Bastnaes, in Sweden, a new earth to which he had given the name of *ochroit*, on account of the red colour which it assumes by calcination. He even sent me in a letter a small specimen of this substance; and having discovered in it, by several trials, the presence of a considerable quantity of oxide of iron, I stated some doubts, in a note which I read in the Institute, in regard to the colour of that earth. I observed also in the same note, that this substance had as many metallic properties as earthy characters; but that the small quantity of it which I had in my possession did not allow me to give any decisive opinion on this subject.

Some time after, Messrs. Berzelius and Hisinger, having been informed, by their correspondents at Paris, of M. Klaproth's labour, wrote to me to claim a priority, stating that they had sent to M. Klaproth the specimens of that mineral which he had employed for his experiments, and that at the same time they had announced to him that they had found a new metal in it. I can give no opinion on this difference. I shall only observe, that the well known delicacy of M. Klaproth, and the high reputation he has justly acquired by his numerous and important discoveries, render it very improbable that he would appropriate to himself the discovery of another. M. Klaproth must, no doubt, have received from another quarter the mineral in question; and his labour was perhaps terminated before he acquired any information respecting that of the Swedish chemists. What seems to justify this opinion is, that they obtained results entirely different.

Everything, therefore, seems to show that M. Klaproth of Berlin, and Messrs. Berzelius and Hisinger of Stockholm, made experiments at the same time on the same mineral without having any communication with each other; and that each may have had the honour of the discovery.

Lanthanum

LANTAN, A NEW METAL, note in Annalen der Physik und Chemie (Poggendorff), vol. 46, p. 648 (1839).

By repeated experiment with cerite from Bastnäs, the mineral in which 36 years ago cerium was discovered, Mosander has found a new metal.

That which, obtained in the usual manner from cerite, is considered cerium oxide, contains almost two-fifths of its weight of oxide of the new metal, whose properties differ only slightly from those of cerium and as it were conceals itself in it. On that account Mosander has given the new metal the name Lantan.

It is prepared when one ignites lantan nitrate mixed with cerium nitrate. The cerium oxide thus loses its solubility in weak acids, and lantan oxide, which is a very strong base, can be taken up in one part of nitric acid in 100 parts of water.

Lantan oxide is not reduced by potassium, but from lantan chloride it will separate a gray metallic powder, which oxidizes slowly in water, with evolution of hydrogen, and changes into a white hydrate.

Lantan sulphide is obtained by strongly heating the oxide in the vapor of carbon disulphide; it is pale yellow and changes in water, with evolution of hydrogen sulphide, into the hydrate.

Lantan oxide has a brick-red color, which does not appear through the cerium oxide present. In hot water it changes into a white hydrate, which turns red litmus-paper blue. It dissolves quickly in acids, even very dilute; in excess it easily forms basic salts.

The salts have an astringent taste, without an admixture of sweetness. Their crystals are usually rose-red. Potassium sulphate precipitates it only if it contains salts of cerium.

Digested with ammonium salts, the oxide dissolves, gradually setting free ammonia. The atomic weight of lantan is less than that heretofore given for cerium, that is, to the mixture of the two metals.

Didymium

CONCERNING A NEW METAL, DIDYM. In Annalen der Physik und Chemie (Poggendorff), Vol. 56 (1842).

After my lecture given to the chemical section of the Scientific Congress at Stockholm, upon a few recent discoveries, Prof. Mosander took occasion to make to the members of that section present an announcement of the highest interest, of which I shall here repeat the main points in short form (to which Prof. Mosander has given his authorization).

The same material which for many years has been considered cerium oxide, and in which Mosander found lanthan as an ingredient, contains, beside these two metals (cerium and lanthan), still a third, which Mosander has named *"Didym,"* for to a certain degree it seems to be a twin brother of Lanthan, and, as it now appears, unfortunately a very *inseparable* one. It is Didymium oxide which gives to the (so-called) cerium oxide its brown color, and which at the same time is the reason some salts of the Yttrium earth show a more or less strong rose-red or amethyst-red color. Pure cerium oxide and lanthanum oxide seem nearly colorless and might in a pure state appear entirely colorless. Cerium hydroxide is sulphur-yellow. Didymium sulphate has a color which is between rose-red and amethyst-red. When the brown Didymium oxide is subjected to strong heat, it loses its color and becomes a dirty white. At the same time, it seems that its weight is not changed by this. Prof. Mosander added also that from a mixture of cerium oxide and lanthan oxide

the latter is taken up very imperfectly by dilute nitric acid. A part of the lanthan remains undissolved, and a part of the cerium oxide is dissolved with it. Ignited cerium oxide is entirely insoluble in dilute nitric acid, *but not if it is mixed with lanthanum oxide.* In spite of the fact that Prof. Mosander has already worked for several years on these interesting bodies (he has known Didym for one and a half years), he has not yet succeeded in finding a good method for their complete isolation. But until he has determined the nature of these three metals and their compounds thoroughly, must we await his further reports upon them.

It seems very probable from these facts that the reactions which I formerly quoted, which I ascribed to lanthan oxide, *are due not to it, but to cerium oxide.* Now everything seems to me to be in a very uncertain state. It appears that every colored oxide which accompanies the yttria of gadolinite from Hitteröen, in which I ventured to surmise a new element, is really Didymium oxide.

Prof. Mosander moreover counsels every chemist who takes up research upon compounds containing cerium, lanthanum, and didymium, to content himself for awhile with the sum of these three oxides, until a good method of separation is found. Approximate determinations of the relative mixtures themselves are of no value, and can even mislead to false inference.

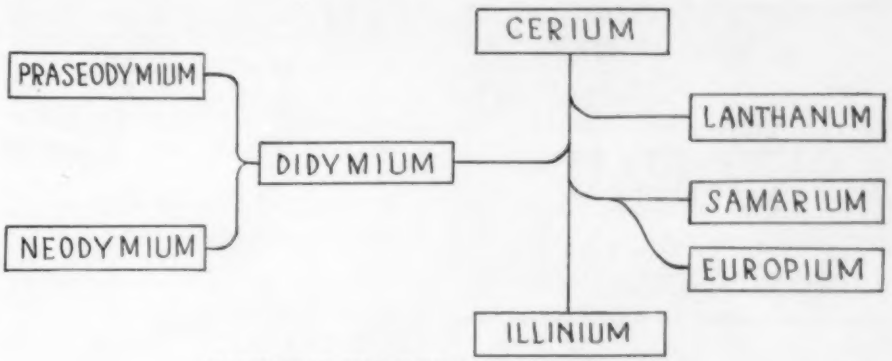
Samarium

NEW SPECTRUM RAYS OBSERVED IN MATERIAL EXTRACTED FROM SAMARSKITE. Note by Lecoq de Boisbaudran. In Comptes Rendus, Vol. 88, p. 322. February 17, 1879.

In examining with the spectroscope, both by absorption and by means of the electric spark, the products of my work upon the mixture of earths from samarskite (rich in didymium), I observed lines or bands not related to any formerly known body and not corresponding to the descriptions of spectrum lines of earths recently announced by Messrs. Delafontaine, L. Smith, Soret and de Marignac.

The new line of emission and those of absorption appear to correspond (at least the principal ones) to a single substance, for they follow similar variations of intensity in the series of products obtained by fractional crystallization. . . .

Awaiting further verification, my two blue absorption bands and my four emission bands seem therefore to indicate the existence of a substance hitherto unknown. I hope soon in a measure to be able to confirm this supposition or to correct certain points in the description of the spectrum of decipium.



FAMILY TREE OF THE CERIUM EARTHS
Including Didymium, which turned out to be two elements.

Praseodymium and Neodymium

SPLITTING DIDYMIUM INTO ITS ELEMENTS, by Carl Auer von Welsbach. In Berichte der Deutschen Chemischen Gesellschaft. 18th year, 3d vol. Berlin: 1885.

The practical method of separation consists in repeating many hundred times the fractional crystallization of ammonium double nitrates of lanthanium and didymium in strong nitric acid solution, by which lanthanum separates first, and finally didymium breaks up into its constituents: Praseodymium (Pr = 143.6) and Neodymium (Nd = 140.8). In the last crystallization the difficultly crystallizable ammonium double salt is converted into the corresponding sodium compound. The absorption spectra of the two new elements are part of the spectrum of didymium: If we mix the two in a definite ratio, the solution color and the original spectrum of didymium appear. The compounds of Praseodymium, which is nearest to Lanthanum, are clear and intense leek-green, those of Neodymium, which makes up the most of the so-called didymium are clear rose or amethyst-colored. The former gives a dark almost blackish brown, the latter a blue oxide, R_2O_3; the former admits also a super-oxide, R_4O_7 (?). The spectrum count of the elements is the same as for the original.

Europium

ON A NEW ELMENT, EUROPIUM. Note by Eugene Demarcay, presented by Henri Moissan. In Comptes Rendus, Vol. 132, p. 1484. June 17, 1901.

In 1885 M. Crookes (Phil. Trans. v. CLXXVI, p. 691), in his beautiful researches on electric fluorescence in a vacuum, reported a band which he attributed to samarium and which, because of its disappearance in the presence of calcium and of some other peculiarities, he called the *anomalous line.* Later he distinguished it with a number of other bands as characterizing apparently some special meta-element. He called the hypothetical meta-element corresponding to the anomalous line S *delta.* M. Lecoq de Boisbaudran, in the course of his important researches on phosphorescence, confirmed the announcements of M. Crookes upon the anomalous line.

In 1892, M. de Boisbaudran described a spectrum of three brilliant blue lines, discovered in the spark spectrum of samarium. These three lines could be strengthened by suitable fractionation. From this he concluded that they correspond to a particular element Z *epsilon.* At the same time he turned his attention to a particular band of the reversal spectrum of samarium which seemed to correspond to the anomalous line and was considerably strengthened in nitric acid solution. M. de Boisbaudran, without stopping for really precise conclusions, was inclined to believe it characteristic of a particular element Z *zeta.*

In 1896, I announced the presence of an element intermediate between gadolinium and samarium, characterized by various strong violet and ultra-violet lines. In 1900, I showed that this new element was identical with Z *epsilon* of M. Lecoq de Boisbaudran, that it was similar to the material to which the anomalous line of M. Crookes was due, the reversal line Z *zeta,* various other reversal lines not (*Please turn page*)

JOSEPH HENRY

The American Co-Discoverer with Faraday of the Way to Get

ELECTRICITY FROM MAGNETISM

Describes his Experiments in

THE NEXT CLASSIC OF SCIENCE

yet described, and, further, a special absorption spectrum unknown until that time. I added that it had not been possible for me to continue the fractionation long enough to affirm positively that all these properties correspond to the same substance. Since then, I have been able, following a considerable number of fractionations of magnesium nitrate, to accumulate a greater quantity of this scarcely abundant element, to fractionate it in turn and to report finally that these different characteristics: line spectrum, spectra of reversal, absorption, electric fluorescence of the sulphate in vacuum (anomalous line); with calcium or gadolinium sulphate, accompany one another very constantly, remain sensibly proportional, and that they evidently characterize the same element.

The apparently contradictory results of MM. Crookes and Boisbaudran are due, I think, to the varying proportion of *Sigma* — Z *epsilon* contained in their material and to the fact that calcium and gadolinium reinforce the spectrum of samarium more than that of the other.

I propose for the new element the name *europium*, with the symbol Eu = 151 (approximately).

Illinium

OBSERVATIONS ON THE RARE EARTHS: XXIII. ELEMENT NO. 61. PARTS ONE AND TWO. By J. Allen Harris with L. F. Yntema and B. Smith Hopkins, in Journal of the American Chemical Society, Vol. 48, June 1926.

Summary:

1. Fractionation of cerium group material as double magnesium nitrate concentrates element No. 61 between neodymium and samarium.

2. All fractions contain so small a proportion of No. 61 that its detection by X-ray analysis is difficult.

3. The absorption bands of Element No. 61 are masked by the broad bands of neodymium and samarium.

4. Fractionation as bromates reverses the order of solubilities interposing gadolinium between No. 61 and samarium and terbium between No. 61 and neodymium. Under these conditions absorption bands probably due to the presence of Element No. 61 become plainly visible. . . .

We base our claim to the discovery of a new element on three different lines of evidence:

1. The presence of lines in the arc spectrum of materials prepared in this laboratory common to both samarium and neodymium and stronger in intermediate fractions. These consist of 130 lines in the red and infra red and five lines toward the violet.

2. The presence in our intermediate fractions of absorption bands which become stronger as the characteristic bands of neodymium and samarium become weaker. The bands at 5816 A. and 5123 A. are especially prominent and their positions confirm the belief that there is a systematic drift in the absorption bands of the rare earth group.

3. The presence of lines in the X-ray emission spectrum corresponding closely to the theoretical position for L *alpha* 1 and L *beta* 1 of Element 61. The mean value obtained for L *alpha* 1 agrees within 0.0004 A. of the value calculated from Siegbahn's precision values. The single reading obtained for L *beta* 1 varies by 0.0040 A. from the calculated value.

Science News Letter, August 29, 1931

ORNITHOLOGY

Duck Shortage Imminent As Breeding Places Dry

DUCK SHOOTING during the coming fall, already shortened by two weeks, may face a still further curtailment as the result of a cooperative survey of the drought situation in the northwestern breeding grounds of the wild fowl, conducted by the United States and Canadian governments. As reported to *Science*, the findings of the field biologists are pessimistic.

Discouraging reports were made of unprecedented drought; of lakes and ponds and marshes turned into dusty barrens with no sign of aquatic life, and of the almost complete absence of water during the period in the great prairie breeding grounds of southwestern Manitoba, southern Saskatchewan as far north as Saskatoon, and Alberta westward to the foothills of the Rocky Mountains and northward to the vicinity of Edmonton.

Science News Letter, August 29, 1931

DR. WILHELMINE E. KEY

Geneticist who checks up on fictionists.

FROM PAGE 135

scribed the daughter born of this unpromising marriage:

"Here is the picture of the 'sport' which is miraculously put forth from this weak, ineffectual family stock. She was beautiful, she was intelligent and ardent. She was admirable and she felt that she was effective; and she had a confidence 'amounting almost to a feeling of power.' She has, too, a wonderful warmth of sympathy and human understanding."

Rosalie, in other words, was a bundle of positive traits, none of which, the author would have us believe, was inherited from her parents. In such an imposing array of characters we would expect some to be dominant, and dominant traits have a way of showing themselves in each generation.

Another stumbling-block which keeps the fiction writer from creating his characters in accordance with scientific laws is the danger of confusing social heredity with physical heredity. Many human lives are ruined, not through any hereditary defect, but through outworn traditions, prejudices, and unfortunate teachings which have been handed down from generation to generation like folk-lore.

The error of blaming physical heredity for the disastrous effects of this social kind of heredity is illustrated, Dr. Key believes, by May Sinclair's "Mary Olivier."

In "The Forsyte Saga," where Galsworthy carries the story of the Forsyte

family through several generations, he had an excellent opportunity to emphasize the way in which the descendents of one family differ from those of other families. Instead of this, the Forsytes rather typify a class. The story of the Forsytes, therefore, is not the story of a particular individualized family, but rather the story of the conflict between the solid, property-owing middle class and the changing social ideas and standards of the modern younger generation.

But it is not necessary to ignore the laws of heredity in order to produce an interesting fiction family, Dr. Key points out. As a demonstration, she points to Margaret Kennedy's "The Fool of the Family." In this book, too, the point of the story hinges on the heredity of the rather odd family portrayed. But Dr. Key says that Margaret Kennedy's appeal to heredity, unlike that of the others cited, is entirely in line with the latest conclusions in the field.

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DENTRISTY

Poor Teeth Are Price Paid By Man For a Better Brain

WHILE BRAINS GROW, teeth rest, and man pays with weak and crooked teeth for a better brain.

Dr. G. Elliot Smith, professor of anatomy of King's College, explained these ideas to the International Orthodontic Congress at London recently. The first seven years of a child's life, he said, are marked by a phenomenal brain growth, and there is a pause in his dental development. For another fifteen years or so he is sluggish in his dental affairs. That is because he is busy adjusting his complicated cerebral apparatus to life's needs. Undoubtedly, he said, the delay in teeth and jaw development is due to these changes.

But while brains are responsible for ugly teeth in man, they have given him a beautiful chin, his distinguishing mark in the animal kingdom. Dr. Smith believes that the part of the jaw that does not bear teeth develops while the rest is held up. The salient chin, he says, is an index of "mental" development. But he does not say that persons with the most promising chins or the most outstanding teeth have the greatest brains.

Certain common beliefs as to the evolution of the human face are not justified, Dr. Smith said. The smallness or absence of the third molar is no sign that man will lose that tooth entirely in the near future. Peking Man, the latest ancient ancestor of human kind discovered, has his third molar small; he may be a million years old. Apes and monkeys, in fact all other primates, have smaller third molars.

Dental troubles such as the crowding and displacing of teeth are not evidence of evolutionary changes going on, Dr. Smith said. Apart from changes resulting from racial mixtures, nothing radical is taking place with human jaws or teeth. People had outgrowing teeth and other troubles 50 centuries ago.

Science News Letter, August 29, 1931

ASTRONOMY

Ryves' Comet Will be Visible After Sunset in Western Sky

RYVES' comet, discovered witnin the past few days by an English amateur astronomer living in Spain, should be visible low in the western evening sky, just after sunset for the next few days. L. E. Cunningham, of the Harvard College Observatory, has just made a preliminary computation of its orbit. This indicates that the comet was at perihelion, or closest to the sun, on August 25.

According to the computations, which are admitted to be somewhat uncertain, the comet should now be in the constellation of Leo, and of the minus 3.4 magnitude. This is almost as brilliant as Venus at its brighest, and brighter than any other permanent astronomical object except the sun and moon. It should be about seven degrees from the sun, and may even be visible in broad daylight. At noon, when the sun is directly south, it should be seen to the left of and a little below the sun, if that body's direct glare is obscured behind the edge of a building, or in some similar way.

Incidentally, this position is only about three degrees away from the position of Nagata's comet when it was discovered by a Japanese amateur astronomer in California a few weeks ago. But then the sun was farther away.

Mr. Cunningham's computations of the orbit are based on observations of Ryves' comet made on August 14, by Dr. George Van Biesbroeck, of the Yerkes Observatory in Wisconsin, and on August 15 and 17 by Dr. E. C. Bower, of the Lick Observatory, in California. Three separate positions of a comet are necessary to determine its orbit. However, if the three are very close together, as was the case with those used by Mr. Cunningham, any slight error is greatly magnified. Only by using three observations spread over a wide arc of the comet's orbit can really precise computations be made. For this reason, Dr. Harlow Shapley, director of the Harvard College Observatory, in announcing Mr. Cunningham's results, states that further observations of the comet are urgently needed.

Though the present computations are very uncertain, they should permit the comet to be kept in view.

Science News Letter, August 29, 1931

ARCHAEOLOGY

Old Terraces in Arizona Tell of Indian Farming

TERRACES made by native farmers who tried to plant their crops on the lower slopes of a mountain centuries ago have been discovered in Arizona by the Van Bergen-Los Angeles Museum Expedition. The expedition is making an archaeological survey of a portion of the area drained by the Black and White Rivers in eastern central Arizona. In the party are Dr. Charles Van Bergen, Arthur Woodward, and Ben Wetherill.

To make their mountain-side cornfields, the prehistoric Indian farmers selected the places where old mountain streams had cut gulleys into the slopes, and using the banked earth brought down by the seasonal waters, they formed ridges, bordered with long rows of stones set on edge.

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GETTING THE "CURE"

This is a part of the treatment for indigestion. The braves toss the patient up and down on their hands, while the medicine man, on the extreme left, merely observes.

ETHNOLOGY

Navajo Cure for Indigestion Costs Well-to-do Indian $500

FIVE HUNDRED dollars to cure a simple case of indigestion. This is the doctor's fee which well-to-do Navajo Indians are paying today in southwest United States in order to have their tribal medicine man and his numerous helpers conduct the old-time native "cures" in the old-time fashion. A twenty-five-cent bottle of soda mints might do the same work, but many of the Navajos prefer the more impressive methods of their grandfathers. Some of the treatments for disease last three days, an investigation has shown, and if the family is wealthy enough to stand the added expense, a Mud Dance is included.

The medicine man's course of treatment includes singing to weaken the powers of evil and the carrying out and "slaying" of the disease. But the most remarkable feature is the Mud Dance, which is the climax of a de luxe cure. This is a combination of mummery and clowning and osteopathic treatment of a primitive sort.

The mud dancers, headed by a medicine man and drummer, have a mud bath specially prepared. The dancers gather in the hogan in which the main ceremonies have been held and one by one emerge from the smoke hole, somersaulting down the earth-covered sides of the dwelling. Then they run in all directions, and woe unto the man they catch. Into the mud he goes, clothes and all. The harder the victim struggles the more firmly his face is ground into the mud and water and the more liberally he is plastered with the sticky mess.

Such dances are exciting, the chase often lasting an hour or more. White spectators, when such happen to be present, are not exempt if the dancers determine to throw them in.

The right of sanctuary is often called into play during the dances. A victim, sorely pressed by the fleet, nearly naked dancers, may dart into the nearest hogan, thereby escaping his persecutors. For it appears to be a rule of the game that a man who gains sanctuary of shelter cannot be dragged out. Often a man may buy off by distributing cigarettes, candy or small change among his captors.

The dancers are clever in capturing their victims. Even men on horseback are not immune. The fleet footmen will surround a horseman like a pack of wolves and by a dexterous twitch throw off the bridle. One man usually seizes the horse's tail, thus causing the beast to become unmanageable, and before the rider has time to escape he is pulled from the saddle and borne in triumph to his muddy bath.

Rude Massage

After the dance, both the dancers and the victims gather about the patient and give rude massage treatments and manipulate the muscles of the back, chest, legs, arms and neck. Tossing the patient in a blanket is one device. Other people who have ailments but who cannot afford to pay for the elaborate ceremony step forward and get the benefit of similar treatments.

Dancers who fall or suffer minor injuries in the lively scrimmage are also kneaded and have medicine sprayed on them from the mouth of the medicine man. Even the horses sometimes fall during the performances, and they too are treated.

All of this costs the patient's family money. This is expended on fights, on the medicine man's bill for services rendered, and on food for the guests. The latter is no small item when two or three hundred hungry Navajos, men, women and children, assemble to help a sick Navajo feel better.

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CALENDAR REFORM

Delegate May be Sent to Calendar Reform Meeting

THE STATE DEPARTMENT may soon make an announcement regarding an official delegate from the United States to attend an international conference on calendar reform in Geneva in October.

The calendar reformists led by George Eastman, retired president of the Eastman Kodak Company, want thirteen months instead of twelve, each with twenty-eight days; or else twelve months neatly catalogued into four quarters of 91 days, 91 days, 91 days and 92 days respectively.

The United States had a delegate at the meeting of the Preparatory Committee—Dr. Charles F. Marvin, chief of the United States Weather Bureau.

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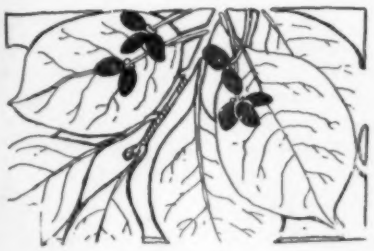
BOTANY

Nature Ramblings

By FRANK THONE



Gum-Trees

EVERYWHERE in the world where the white man has gone, he has given the name "gum" to some kind of tree or other, often without regard to whether the tree thus designated contains any kind of gum. In Australia and New Zealand the eucalypti are "gums," and settlers in certain parts of Australia pridefully call themselves "gumsuckers." In our own country there are several trees, most remotely related to the antipodean genus, that are also called gums.

They grow principally in the South, with extensions of their bailiwick northward and westward at least as far as the Great Lakes. One, perhaps the most familiar, is the so-called sweet-gum, or liquidambar. Its star-shaped leaves and spiky fruits make the tree a most picturesque one, especally when the first cool weather of autumn has turned its foliage to a rich red wine-color.

Quite as numerous, however, and fully as worthy, are the Nyssas, known variously as black-gum and sour-gum. There are two principal species, one a dweller in swampy flatwoods by preference, the other usually found on moist but well-drained hillsides. These trees have lance-shaped leaves, of a rich glossy green that shines strongly in the sunlight. Their fruits are sure identification marks: slender stems, each with twin berries about the size of cherry pits, somewhat oval in shape, turning purplish black as they become ripe.

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Dictionary makers have to pass upon about 3,000 new words every year, deciding whether or not to admit the newcomers to the "American" language.

CHEMISTRY

Intensely Sweet Substance Insipid After Splitting

A NATURAL substance 300 times sweeter than cane sugar, rivalling some of the coal-tar products of chemical laboratories, has been shown by two French chemists to consist of a chemical union of common glucose and another compound which has little or no taste. United, they are intensely sweet; divided, they are not even as sweet as ordinary sugar.

The compound bears the chemical name "stevioside," because it occurs in a South American plant known to botanists as *Stevia*. The plant itself was first introduced to the scientific world about the beginning of the present century; it is a close relative of such familiar North American weeds as boneset, Joe-Pye-weed, and the plant that causes occasional outbreaks of milk sickness in the Midwest. After its discovery by Europeans it rapidly acquired the name of "the sweetest plant in the world." A very small piece sufficed to sweeten a cup of coffee or tea.

During the past generation several partially successful attempts have been made to isolate and study the particular substance in the plant that made it so intensely sweet. It has remained, however, for the French chemists, MM. Briddel and Lavielle, to accomplish the final purification.

They have discovered, to their surprise, that the sweet crystals of stevioside, upon chemical treatment to remove a part of the combined water in them, break apart into about 60 per cent. common glucose and 40 per cent. of a new stuff which they called "steviol." The latter has no taste, but combined with the glucose it produces a most poignantly sweet substance.

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PSYCHOLOGY

Hands of Idiot Children Cleverer Than Their Heads

TO SAY that an idiot child has a mental age of two years or three years is somewhat misleading, it appears as a result of a comparison made at the Training School at Vineland, New Jersey, by Dr. Edgar A. Doll and Cecelia G. Aldrich between the abilities of idiot children and of normal infants of the same mental age.

Although the total mental test scores of the idiots and the infants with whom they were compared came out about the same, the individual abilities and disabilities were very different. All tests involving language ability put the idiot children at a disadvantage, but tests requiring manual dexterity showed the idiots to be superior in this respect.

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First Glances at New Books

Medicine-Archaeology

THE PAPYRUS EBERS — Cecil P. Bryan—*Appleton,* 167 p., $3. For the first time an English interpretation of the famous old Egyptian medical work, the Ebers Papyrus, has been made. Mr. Bryan, who is anatomist at University College, London, has presented the material very much as he might tell it to a class of students. His comments and explanations are clear and he writes about the subject as thought he liked it. As Prof. G. Elliot Smith points out in the introduction, Mr. Bryan's work is a needed one of popularization.

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Chemistry

THE PRINCIPLES OF ORGANIC CHEMISTRY—James F. Norris—*McGraw-Hill,* 3rd edition, 595 p., $3. A new edition of a standard text-book, with additional material. A new format enables it to be better without being bigger.

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Child Training

YOUR SON AND MINE—John T. McGovern—*Stokes,* 185 p., $2. In a series of very interesting semi-fictional biographies, the author, who is an expert on boys, shows how parents and educators may make well-nigh fatal errors in directing the education of youth, and how these mistakes may be partially corrected. A good book.

Science News Letter, August 29, 1931

Entomology

SOCIAL BEHAVIOUR IN INSECTS—A. D. Imms—*Dial Press,* 117 p., $1.50. A small book on a perennially interesting subject, by a well-known British writer.

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Physics

THE UNIVERSE FROM CRYSTAL SPHERES TO RELATIVITY—Frank Allen—*Harcourt, Brace,* 145 p., $2. Originally a lecture, this book is designed to be read through at a sitting. It gives a rapid but comprehensive sweep over physical theories of the universe, with emphasis on modern concepts.

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Psychology

ORDER OF BIRTH, PARENTAGE, AND INTELLIGENCE—L. L. Thurstone and Richard L. Jenkins—*University of Chicago Press,* 135 p., $3. A careful statistical study published as one of the Behavior Research Fund Monographs. The authors have found that first-born children are handicapped in some ways, but this may be due to the fact that small families are handicapped. Intelligence, figures indicate, is greater among the younger children in families.

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Sociology

AMERICAN CIVIC ANNUAL, VOL. III—Edited by Harlean James—*American Civic Association,* 350 p. In this, the third annual volume issued by the American Civic Association, there is a record of progress and hopes in matters affecting the common weal, ranging all the way from new National Parks and the beautification of the National Capital to suggestions on how to make filling stations look decent.

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Photography

PRACTICAL PHOTOGRAPHY, NO. 5: HOW TO MAKE ENLARGEMENTS—Frank R. Fraprie and Arthur Hammond—*American Photographic Publishing Co.,* 96 p., 40c. A thoroughly practical manual which gives the necessary formulas at the beginning, then directions for making enlarging cameras, for use of light, solutions, apparatus, and many important bits of advice.

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Geology

ELEMENTS OF GEOLOGY—W. J. Miller—*Van Nostrand,* 495 p., $3. A well-balanced text book for a one-semester college course.

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Botany

SEED DISPERSAL—W. A. Matheny—*Slingerland - Comstock Co.,* 141 p., $1.50. A small book suitable for use in the upper grades or in high school, or for Boy Scouts. It tells many facts about the travels of seeds that many older persons never knew, and suggests experiments that anybody can perform with good returns in information.

Science News Letter, August 29, 1931

Forestry

FOREST FACTS FOR SCHOOLS—C. L. Pack and Tom Gill—*Macmillan,* 336 p., $1. A book well filled with carefully selected facts about forests done in a style suitable for school use, by a pair of well-known promoters of forest information and of interest in American forest life.

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Ethnology-Folk-Lore

PANSLAVONIC FOLK-LORE—W. W. Strickland—*Westermann,* 469 p., $3.50. Tale after tale is recounted in this fascinating volume. There are northwest Slav legends and fairy stories, south Slavonic folk-lore stories, and Russian and Bulgarian folk-lore stories. The translations are from Karel Jaromir Erben's collection of "A Hundred Genuine Popular Slavonic Fairy Stories in the Original Dialects." This fine story-teller's pack of tales is more significant by reason of the author's notes, comments, diagrams, and other interpretative material, which make the publication an ethnological work of value.

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Botany

STUDIES ON THE GENUS PYTHIUM—Velma Dare Matthews—*University of North Carolina Press,* 136 p., $3. This book, a treatise on the taxonomy of one of the most important genera of parasitic fungi, will appeal to a limited audience only, but to this group it will be of exceedingly great interest.

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Pharmacology

LANE LECTURES ON PHARMACOLOGY—Walther Straub—*Stanford University Press,* 87 p., $1. Selecting intoxicating drugs as of most interest to the layman, anaesthesia, compounds of heavy metals, and camphor as subjects of importance to physicians, and digitalis chemistry and biochemistry as the research he wished to report to his fellow-investigators, Dr. Straub offers interesting news about drugs of life and death.

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Protozoology

THE FORAMINIFERA OF THE ATLANTIC OCEAN, PART 8—J. A. Cushman—*U. S. Government Printing Office,* 179 p., 26 pl., 65c. Treats of families Rotaliidae through Homotremidae.

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Anthropology-Sociology

MAN'S OWN SHOW: CIVILIZATION—George A. Dorsey—*Harper,* 977 p., $5. What man, after becoming a human being, did with himself. How he conquered his environment, built the civilizations preceding ours, and arrived at the machine age, and some prophecies as to what he will do next. All in the racy, informal style which Dr. Dorsey wrote so well.

Science News Letter, August 29, 1931